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FOREST PLANTING LEAFLET.

BUR OAK (*Quercus macrocarpa*).

FORM AND SIZE.

Bur oak is one of the largest trees found in eastern and central North America. It frequently attains a height of from 80 to 90 feet and a diameter of from 3 to 4 feet. Under the most favorable conditions it often exceeds 100 feet in height, and a single tree 165 feet high and 7 feet in diameter has been measured. When grown free the crown is large and heavy; in the forest it is usually contracted and covers only the upper part of the tree.

Bur oak owes its name to the mossy or bur-like appearance of its deep acorn cup. The leaf is large and deeply lobed and resembles that of the white oak. When the twigs are from three to four years old they begin to develop corky wings, which sometimes attain a width of an inch or more. These disappear as the branch grows older, and consequently are seen only on the younger growth.

Bur oak has one well-developed taproot, and, in moderately rich and moist soils, many spreading secondary roots close to the surface. In dry soils the roots seek moisture at considerable depth.

RANGE.

The natural range of bur oak is from Manitoba to Texas and eastward to the Atlantic coast. It is commonest and most important in the lowland forests of the Mississippi basin, where it is found associated with white oak, basswood, white ash, cottonwood, black walnut, and several hickories. In the Dakotas and about the Great Lakes it sometimes appears in pure stands, and is a conspicuous member of the characteristic "oak openings." East of the Allegheny Mountains it is comparatively rare and local, and near the northern

and northwestern limits of its range it dwindles to a mere shrub. Bur oak may be planted on good soils almost anywhere east of the ninety-eighth meridian and in exceptionally favorable situations somewhat farther west.

SILVICAL QUALITIES.

Bur oak is best suited to deep, rich, river bottom soils. It will maintain itself in poorer upland localities, but it is recommended for planting only where the soil is fairly good, moist, and well drained, and where protracted droughts are infrequent. It is rather intolerant of shade, and will not thrive beneath the crowns of taller trees.

The rate of growth is slow, and resembles that of white oak; it is slower than that of red oak. It is especially slow in poor, dry soil, and also near the northern limit of its range.

Bur oak is subject to comparatively few pests or diseases.

ECONOMIC USES.

Bur oak is one of the most valuable hardwood trees in North America, and is an excellent tree for forest planting where rapid growth is not desired. The wood is heavy, hard, very strong, and durable. In the markets it is not, and need not be, distinguished from other trees of the white oak class, all of which are commercially known as white oak, and are used for the same purposes, such as construction, interior finishing, agricultural implements, etc. The heartwood makes especially good fence posts and railroad ties, but the sapwood does not last long in the ground.

Its long life, striking form, heavy shade, and relative freedom from disease, make bur oak a valuable decorative tree.

METHODS OF PROPAGATION.

Bur oak reproduces freely both by acorns and by stump sprouts. The acorns, like those of all the white oaks, mature in one season, and germinate soon after falling. They should therefore be planted, if possible, in the fall. Mice and squirrels are fond of acorns, and sometimes destroy plantations made in the fall. Where this is to be feared, or where for any other reason it is necessary to hold them over until spring, the acorns may be stored between layers of moist sand.

Sprouting can not be depended upon to produce useful trees except from stumps less than a foot in diameter and on good soil. To secure vigorous sprouts the trees should be felled between November and March, and the stumps should be cut low and left smooth and slanting on top. Sprouts then start close to the ground, where they can soon develop root systems of their own and become self-supporting. The slanting stump causes the rain water to run off, and thus helps to prevent rapid decay.

PLANTING.

It is usually advisable to plant acorns in their permanent place in the field, for, like all oaks, bur oak is not easy to transplant when once fairly established, because of its stout taproot.

The acorns should generally be planted in holes from 4 to 6 feet apart each way. Three or four acorns should be placed in each hole and covered with about $1\frac{1}{2}$ inches of earth. If the planting is done on plow land, the soil may be prepared as for any field crop.

Bur oak can be grown in pure stands, but it is often desirable to mix with it one or two other slow-growing species, such as sugar maple or white elm, in order to force the trees to grow tall and to clear the stems of their lower branches.

Bur oak should not be planted with trees which grow very rapidly, nor where the climate is so dry that the soil needs much cultivation to preserve its moisture. Care should be taken to keep the little trees from being smothered by grass and weeds, to keep out stock and fire, and to let the plantation acquire the character of a forest as soon as it can. Weeds and litter on the ground, and shrubs that stand below the crowns of the trees, are good and should not be interfered with. If the trees are planted as closely as 4 feet each way, they will probably need thinning within 10 or 15 years.

Approved:

JAMES WILSON,

Secretary of Agriculture.

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